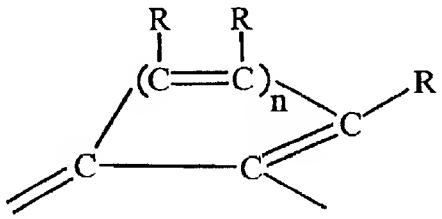
IN THE CLAIMS:

1. (Original) A catalyst system for coordination polymerization comprising an activated Group 3 or Lanthanide metal stabilized by a monoanionic bidentate ancillary ligand and two monoanionic ligands, wherein the ancillary ligand and the metal form a metallocyclic ring comprising at least five atoms.

2. (Original) The catalyst system of claim 1 wherein the metal comprises scandium or yttrium.

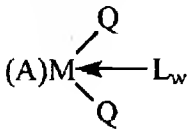
3. (Original) The catalyst system of claim 1 wherein the ancillary ligand has the formula $(C_5H_{4-x}R_x)TE$ wherein x is a number from 0 to 4 denoting the degree of substitution, each R is, independently, a radical selected from C_1-C_{20} hydrocarbyl radicals, C_1-C_{20} substituted hydrocarbyl radicals wherein one or more hydrogen atoms are replaced by a halogen atom, amido, phosphido, alkoxy or aryloxy or any other radical containing a Lewis acidic or basic functionality, C_1-C_{20} hydrocarbyl-substituted metalloid radicals wherein the metalloid is selected from Group 14 of the Periodic Table of the Elements, and halogen radicals, or $C_5H_{4-x}R_x$ is a cyclopentadienyl ring in which two adjacent R-groups are joined to form a C_4-C_{20} ring to give a saturated or unsaturated polycyclic cyclopentadienyl ligand; T is a covalent bridging group containing a Group 14 or 15 element; E is a π-donating ligand or JR'_z wherein J is an element from Group 15 or 16; z is 2 when J is a Group 15 element and 1 when J is a Group 16 element; each R' is independently a radical selected from C_1-C_{20} hydrocarbyl radicals, a substituted C_1-C_{20} hydrocarbyl radical wherein one or more hydrogen atoms is replaced by a halogen atom, amido, phosphido, alkoxy or aryloxy or any other radical containing a Lewis acidic or basic functionality and C_1-C_{20} hydrocarbyl-substituted metalloid radicals wherein the metalloid is selected from Group 14 of the Periodic Table of the Elements.

4. (Currently Amended) The catalyst system of claim 1 wherein the ancillary ligand has the formula -NR'=T'-NR'- wherein N is nitrogen, each R' is independently a radical selected from the group consisting of C_1-C_{20} hydrocarbyl radicals, substituted C_1-C_{20} hydrocarbyl radicals wherein one or more hydrogen atoms are replaced by a halogen atom, and C_1-C_{20} hydrocarbyl-substituted metalloid radicals wherein the metalloid is selected from Group 14 of the Periodic Table of the Elements, T' is a covalent bridging group selected from $=C(R)[C(R)=C(R)]_n-$ and



wherein each R is, independently, a radical selected from C_1-C_{20} hydrocarbyl radicals, C_1-C_{20} substituted hydrocarbyl radical wherein one or more hydrogen atoms is replaced by a halogen atom, amido, phosphido, alkoxy or aryloxy or any other radical containing a Lewis acidic or basic functionality, C_1-C_{20} hydrocarbyl-substituted metalloid radicals wherein the metalloid is selected from Group 14 of the Periodic Table of the Elements, halogen radicals or two adjacent R groups are joined to form a C_4-C_{20} ring, except that R independently may also be hydrogen except for R groups attached to the carbon atoms directly bonded to the nitrogen atoms, and n is 1, 2, 3 or 4.

5. (Original) A Group 3 or Lanthanide metal complex of the formula



wherein, M is a Group 3 or Lanthanide metal;

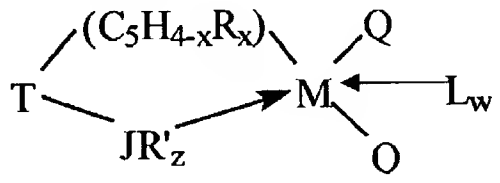
A is a monoanionic bidentate ancillary ligand which forms a metallocycle with at least 5 primary atoms;

each Q is independently a monoanionic ligand;

L is a neutral Lewis base; and

w is a number from 0 to 3.

6. (Currently Amended) A Group 3 or Lanthanide metal complex of the formula



wherein M is a group 3 or Lanthanide metal;

$C_5H_{4-x}R_x$ is a cyclopentadienyl ring covalently π-bound to M and substituted with from zero to four substituent groups R;

x is a number from 0 to 4 denoting the degree of substitution of $C_5H_{4-x}R_x$;

each R is, independently, a radical selected from C_1-C_{20} hydrocarbyl radicals, C_1-C_{20} substituted hydrocarbyl radicals wherein one or more hydrogen atoms are replaced by a halogen atom, amido, phosphido, alkoxy or aryloxy or any other radical containing a Lewis acidic or basic functionality, C_1-C_{20} hydrocarbyl-substituted metalloid radicals wherein the metalloid is selected from Group 14 of the Periodic Table of the Elements, and halogen radicals, or $C_5H_{4-x}R_x$ is a cyclopentadienyl ring in which two adjacent R-groups are joined to form a C_4-C_{20} ring to give a saturated or unsaturated polycyclic cyclopentadienyl ligand which may be additionally substituted with one or more R groups;

T is a covalent bridging group containing a Group 14 or 15 element;

L is a neutral Lewis base;

w is a number from 0 to 3;

J is a Group 15 or 16 element;

z is 2 when J is a Group 15 element and 1 when J is a Group 16 element;

each R' is independently a radical selected from C_1-C_{20} hydrocarbyl radicals, substituted C_1-C_{20} hydrocarbyl radicals wherein one or more hydrogen atoms

is replaced by a halogen atom, and C_1-C_{20} hydrocarbyl-substituted metalloid radical wherein the metalloid is selected from Group 14 of the Periodic Table of the Elements; and

each Q is independently a univalent anionic ligand.

7. (Original) The complex of claim 6 wherein M is scandium, yttrium or lanthanum.

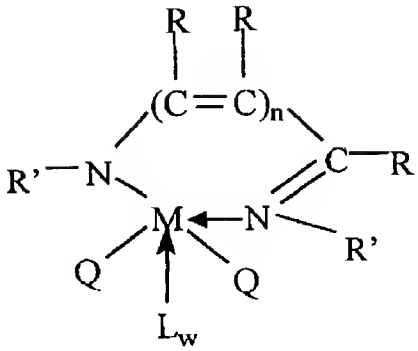
8. (Original) The complex of claim 6 wherein T is a dialkyl, alkylaryl or diaryl silicon or germanium radical.

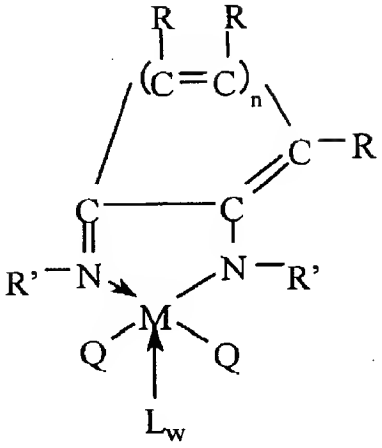
9. (Original) The complex of claim 6 wherein T is alkyl or aryl phosphine or amine radical or a hydrocarbyl radical.

10. (Original) The complex of claim 6 wherein J is oxygen, sulfur, nitrogen or phosphorus.

11. (Original) The complex of claim 6 wherein J is nitrogen.

12. (Currently Amended) A Group 3 or Lanthanide metal complex having one of the formulae





wherein M is a Group 3 or Lanthanide metal;

each R is independently hydrogen, halogen, a C_1-C_{20} hydrocarbyl, or a substituted C_1-C_{20} hydrocarbyl wherein one or more hydrogen atoms is replaced by a halogen atom, amido, phosphido, alkoxy or aryloxy or any other radical containing a Lewis acidic or basic functionality, C_1-C_{20} hydrocarbyl-substituted metalloid radical wherein the metalloid is selected from Group 14 of the Periodic Table of the Elements, or two adjacent R-groups are joined to form a C_4-C_{20} ring, except that R independently may also be hydrogen except for R groups attached to the carbon atoms directly bonded to the nitrogen atoms;

n is 1, 2, 3 or 4;

each R' is independently a radical selected from the group consisting of C_1-C_{20} hydrocarbyl radicals, substituted C_1-C_{20} hydrocarbyl radicals wherein one or more hydrogen atoms are replaced by a halogen atom, and C_1-C_{20} hydrocarbyl-substituted metalloid radicals wherein the metalloid is selected from Group 14 of the Periodic Table of the Elements;

each Q is independently a monoanionic ligand;

L is a neutral Lewis base; and

w is a number from 0 to 3.

13. (Original) The complex of claim 10 wherein M is scandium, yttrium, or lanthanum.

14. (Previously Presented) A process for olefin polymerization comprising contacting, under olefin polymerization conditions, one or more olefin monomers with an activated Group-3 or Lanthanide metal stabilized by

a) a monoanionic bidentate ligand, and

b) two monoanionic ligands,

wherein the bidentate ligand and the metal form a metallocyclic ring comprising at least five atoms.

15. (Original) A process for olefin polymerization comprising activating the metal complex of any one of claims 5-11 to a cationic form and contacting one or more olefin monomers therewith under olefin polymerization.

16. (Original) A process for olefin polymerization comprising activating the metal complex of any one of claims 12 and 13 to a cationic form and contacting one or more olefin monomers therewith under olefin polymerization.

17. (Previously Presented) The process for olefin polymerization of claim 14 wherein the metal comprises scandium or yttrium.

18. (Currently Amended) The process for olefin polymerization of claim 14 wherein the bidentate ligand has the formula:

$(C_5H_{4-x}R_x)TE$ wherein

a) x is a number from 0 to 4,

b) each R is, independently, a radical selected from

(i) C_1-C_{20} hydrocarbyl radicals,

(ii) C_1-C_{20} substituted hydrocarbyl radicals wherein one or more hydrogen atoms are replaced by a halogen atom, amido, phosphido, alkoxy or aryloxy or other Lewis-acid- or -base-containing radical,

(iii) C_1-C_{20} hydrocarbyl-substituted Group-14 metalloid radicals, ~~or~~

(iv) halogen radicals, or

(v) two adjacent R-groups are joined to form a C_3-C_{20} ring to give a saturated or unsaturated polycyclic cyclopentadienyl ligand

~~or $C_5H_{4-x}R_x$ is a cyclopentadienyl ring wherein~~

~~a) x is a number from 0 to 4,~~

~~b) two adjacent R-groups are joined to form a C_4-C_{20} ring to give a saturated or unsaturated polycyclic cyclopentadienyl ligand;~~

c) T is a covalent bridging group containing a Group-14 or -15 element;

d) E is a π-donating ligand or JR'_z wherein

(i) J is an element from Group-15 or -16;

(ii) z is 2 when J is a Group-15 element and 1 when J is a Group-16 element;

(iii) each R' is independently a radical selected from

1) C_1-C_{20} hydrocarbyl radicals,

2) a substituted C_1-C_{20} hydrocarbyl radical wherein one or more hydrogen atoms is replaced by a halogen atom, amido, phosphido, alkoxy or aryloxy or other Lewis-acid- or -base-containing radical or

3) C_1-C_{20} hydrocarbyl-substituted, Group-14 metalloid radicals.

19. (Currently Amended) The process for olefin polymerization of claim 14 wherein the ancillary ligand has the formula:

-NR'=T'-NR'-

wherein

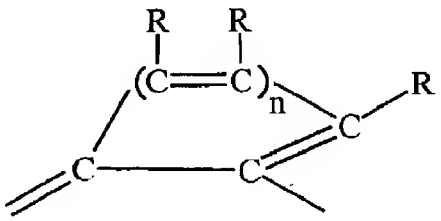
a) N is nitrogen,

b) each R' is independently a radical selected from the group consisting of C_1-C_{20} hydrocarbyl radicals, substituted C_1-C_{20} hydrocarbyl radicals wherein one or more hydrogen atoms are replaced by a halogen atom, and C_1-C_{20} hydrocarbyl-substituted metalloid radicals wherein the metalloid is selected from Group 14 of the Periodic Table of the Elements

~~b)~~ c) T' is a covalent bridging group selected from

$=C(R)[C(R)=C(R)]_n-$

and



wherein each R is, independently, a radical selected from

(i) C_1-C_{20} hydrocarbyl radicals,

(ii) C_1-C_{20} substituted hydrocarbyl radical wherein one or more hydrogen atoms is replaced by a halogen atom, amido, phosphido, alkoxy or aryloxy or other Lewis-acid- or -base-containing radical,

(iii) C_1-C_{20} hydrocarbyl-substituted Group-14 metalloid radicals,

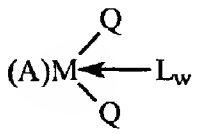
(iv) halogen radicals, or

(v) two adjacent R groups are joined to form a C_4-C_{20} ring, except that R independently may also be hydrogen except for R groups attached to the carbon atoms directly bonded to the nitrogen atoms, and

(vi) n is 1, 2, 3, or 4.

20. (Previously Presented) A process for olefin polymerization comprising:

a) activating a metal complex to a cationic form, wherein the metal complex comprises a Group-3 or Lanthanide metal complex of the formula



wherein,

(i) M is a Group-3 or Lanthanide metal;

(ii) A is a monoanionic bidentate ancillary ligand which forms a metallocycle with at least 5 primary atoms;

(iii) each Q is independently a monoanionic ligand;

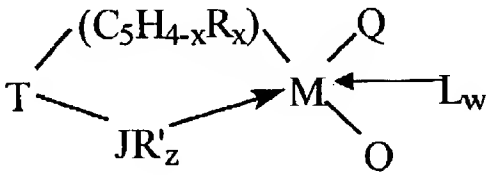
(iv) L is a neutral Lewis base; and

(v) w is a number from 0 to 3;

and

b) contacting one or more olefin monomers with the activated metal complex under olefin polymerization conditions.

21. (Currently Amended) The process for olefin polymerization of claim 20, wherein the Group-3 or Lanthanide metal complex has the formula



wherein

a) M is a Group-3 or Lanthanide metal;

b) $C_5H_{4-x}R_x$ is a cyclopentadienyl ring covalently π-bound to M and substituted with from zero to four substituent groups R;

c) x is a number from 0 to 4 denoting the degree of substitution of $C_5H_{4-x}R_x$;

d) each R is, independently, a radical selected from C_1-C_{20} hydrocarbyl radicals, C_1-C_{20} substituted hydrocarbyl radicals wherein one or more hydrogen atoms are replaced by a halogen atom, amido, phosphido, alkoxy or aryloxy or other Lewis-acid- or -base-containing radical, C_1-C_{20} hydrocarbyl-substituted metalloid radicals wherein the metalloid is selected from Group-14 elements, and halogen radicals, or $C_5H_{4-x}R_x$ is a cyclopentadienyl ring in which two adjacent R-groups are joined to form a C_4-C_{20} ring to give a saturated or unsaturated polycyclic cyclopentadienyl ligand which may be additionally substituted with one or more R groups;

e) T is a covalent bridging group containing a Group-14 or -15 element;

f) J is a Group-15 or -16 element;

g) z is 2 when J is a Group-15 element and 1 when J is a Group-16 element;

h) each R' is independently a radical selected from C_1-C_{20} hydrocarbyl radicals, substituted C_1-C_{20} hydrocarbyl radicals wherein one or more hydrogen atoms is replaced by a halogen atom, and C_1-C_{20} hydrocarbyl-substituted metalloid radical wherein the metalloid is selected from Group-14 elements; ~~and~~

i) each Q is independently a univalent anionic ligand;

j) L is a neutral Lewis base; and

k) w is a number from 0 to 3.

22. (Previously Presented) The process for olefin polymerization of claim 21 wherein M is scandium, yttrium or lanthanum.

23. (Previously Presented) The process for olefin polymerization of claim 21 wherein T is a dialkyl, alkylaryl or diaryl silicon or germanium radical.

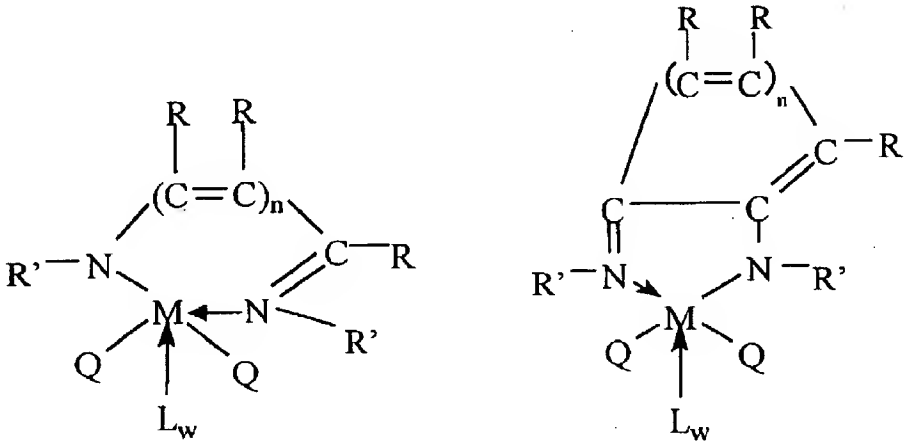
24. (Previously Presented) The process for olefin polymerization of claim 21 wherein T is alkyl or aryl phosphine or amine radical or a hydrocarbyl radical.

25. (Previously Presented) The process for olefin polymerization of claim 21 wherein J is oxygen, sulfur, nitrogen or phosphorus.

26. (Previously Presented) The process for olefin polymerization of claim 21 wherein J is nitrogen.

27. (Currently Amended) A process for olefin polymerization comprising

a) activating a Group-3 or Lanthanide metal complex to a cationic form wherein the metal complex has one of the formulas:



wherein

(i) M is a Group-3 or Lanthanide metal;

(ii) each R' is independently a radical selected from the group consisting of C_1-C_{20} hydrocarbyl radicals, substituted C_1-C_{20} hydrocarbyl radicals wherein one or more hydrogen atoms are replaced by a halogen atom, and C_1-C_{20} hydrocarbyl-substituted metalloid radicals wherein the metalloid is selected from Group 14 of the Periodic Table of the Elements

~~(ii)~~ (iii) each R is independently hydrogen, halogen, a C_1-C_{20} hydrocarbyl, or a substituted C_1-C_{20} hydrocarbyl wherein one or more hydrogen atoms is replaced by a halogen atom, amido, phosphido, alkoxy or aryloxy or other Lewis-acid- or -base-containing radical, C_1-C_{20} hydrocarbyl-substituted metalloid radical wherein the metalloid is selected from Group-14 elements, or two adjacent R-groups are joined to form a C_4-C_{20} ring, except that R independently may also be

hydrogen except for R groups attached to the carbon atoms directly bonded to the nitrogen atoms;

~~(iii)~~ (iv) n is 1, 2, 3, or 4;

~~(iv)~~ (v) each Q is independently a monoanionic ligand;

~~(v)~~ (vi) L is a neutral Lewis base; and

~~(vi)~~ (vii) w is a number from 0 to 3;

and

b) contacting one or more olefin monomers with the activated metal complex under olefin polymerization conditions.

28. (Previously Presented) The complex of claim 27 wherein M is scandium, yttrium, or lanthanum.